The object of such advance in scientific education is not, necessarily, to evolve a corps of researchers, tho doubtless a few geniuses may thus be discovered, but to so increase our general intellectuality that we may truly respond to the widespread popular belief that the Weather Bureau observers, section directors, and forecasters represent a very high type of government official.

This appeal is to the young men in the service—some of us are too old to be accepted as college students.—*C. A.*

WEATHER BUREAU MEN AS UNIVERSITY STUDENTS.

By JOHN K. HOOPER, Observer. Dated New Haven, Conn., July 18, 1908.

The Editor suggests that I write an article for publication in the MONTHLY WEATHER REVIEW, showing how it has been possible for me to take a special course of study at Yale University while performing the regular duties of assistant in the local office of the Weather Bureau at New Haven, Conn.

During the several years devoted to reading and study incident to preparing for the examinations required in the Weather Bureau as tests of educational efficiency, I became anxious to obtain a more extended knowledge of the branches of science germane to meteorology, than a mere course of reading could accomplish. I then decided that whenever an opportunity offered I would take up a course in those branches, under competent instruction.

The opportunity came to me when I was assigned to New Haven station in 1903. I made an added effort to complete the Weather Bureau examinations as soon as possible, and was able to register in the graduate department of Yale University at the opening of the college year in 1906.

By the advice of the university authorities, to whom I had explained just what I hoped to accomplish, and, with the permission of the Chief of Bureau, I took up the following preparatory course of study:

Elementary physics, three hours per week, Monday, Wednesday, and Friday, 2 p. m. Elementary laboratory physics, three hours per week, Thursday, 2 p. m. Analytical geometry and calculus, three hours per week, Tuesday, Thursday, and Saturday, 11:30 a. m.

These were the undergraduate courses of the academic department. They continued thruout the year.

The following year I took: Introduction to theoretical physics, three hours per week, Monday, Wednesday, and Friday, 11:30 a. m. This course continued thruout the college year of 1907–8.

During the first year I arranged to be excused from station duty on Monday, Wednesday, and Friday, from 2 to 3 p. m. then returned to the office and worked that much longer on those days. On Thursday I was excused from 2 to 5 p m. and after the period in the labratory, I remained at the office until the evening observation, and the work connected with it had been finished, eating the evening meal after that time.

It was not necessary to make any especial arrangement for mathematics on Tuesday, Thursday, and Saturday, as that period was during my lunch hour. To save time, however, I brought my lunch with me on those days and ate it in the office after 12:30 p. m. I did this same way during the second year on Monday, Wednesday, and Friday.

The studying was done at home in the evening. I did not attempt a regular schedule for each day, but took as much time as the various assignments required, sometimes being up until quite late. I allowed myself at least one evening each week for recreation, and took a complete rest on Sunday with the exception of station duty in the evening.

I do not say that this course has been taken without some self-denial and discomfort, but I am certain that with this additional knowledge of physics and mathematics I am now better equipped to pursue the study of meteorology, and this more than counterbalances any inconvenience I may have undergone while obtaining it.

I do not consider that I have accomplished more than is possible for the majority of Weather Bureau employees. Many are even more conveniently situated than I have been, particularly those whose stations are located in university buildings or on university ground. The hours of duty in the service are such that any man so inclined can pursue some branch of study helpful to himself, and thru him of benefit to the Bureau.

Other branches of science are looking to meteorology for the solution of many of their own problems. Geographically we are the best fitted of any nation to solve the problems of the atmosphere. This should be a sufficient incentive to the men of the United States Weather Bureau to do all in their power to place meteorology in its proper position in coordinated knowledge—among the exact sciences.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them. Anonymous publications are indicated by a ——.

Association française pour l'avancement des sciences.
Compte rendu de la 36me session. Reims 1907. Notes et mémoires. Paris. 1908. 1718 p. 8°.

Baden. Centralbureau für Meteorologie und Hydrographie.
Anleitung für die meteorologischen Stationen in Grossherzogtum Baden. Karlsruhe. 1908. 48 p. 8°.

Bemmelen, W. van.
On the rainfall in Java. Results of the observations at more than 700 stations in the period 1879 to 1905. Batavia. 1908. 83 p. f°.

British Guiana. Botanic gardens.
Report ... 1896–1907. Georgetown. 1898–1907. f°.

Claudel, J.
Handbook of mathematics. New York. 1906. ix, 708 p. 8°.

Colorado college observatory.
... Semiannual bulletin no. 5. Meteorological statistics for 1907. Colorado Springs. 1908. p. 101–135. 8°. (Colorado college publications. General series no. 36. Science series v. 12. no. 5.)

Durand-Gréville, E.
... Le mammatus. Paris. 8p. (Extrait du Bulletin de la Société astronomique de France, Janvier 1901.)

Egypt. Survey department.
Instructions for the meteorological observers [English and Arabic]. n. t. p. 7 p. f°.

Foerster, Wilhelm.
Von der Erdatmosphäre zum Himmelsräume. Berlin. 1906. 115 p. 8°.

France. Bureau central météorologique de France.
Annales. Année 1905. II. Observations. Paris. 1908. v. p. f°. Same. III. Pluies. Paris. 1907. (8), 145 p. f°.

Hedrick, U. P.
The relation of weather to the setting of fruit; with blooming data for 866 varieties of fruit. (New York Agricultural station. Bull. no. 299. March, 1908. Geneva. 138 p. 8°.)

Hejas, E. and Rethy A.
Die Häufigkeit des Niederschlags in Ungarn nach 15-jährigen Beobachtungen (1886–1900) von 20 Stationen. Budapest. 1908. 23 p. f°. (Aus den Jahrbücher der königl. ung. Reichsanstalt für Meteorologie und Erdmagnetismus. 35. Band. Jahrgang 1905. 4. Theil.)

Hörmann, Ludwig von.
Wetterherren und Wetterfrauen in den Alpen. (Sonderabdruck aus der Zeitschrift des Deutschen und Österreichischen Alpenvereins 1907 (38. Band).) München. 1907. p. 93–114. 4°.

Innsbruck. Universität. Meteorologisches Observatorium.
Beobachtungen ... 1905. Innsbruck. 1907. n. p. 8°.

Italy. Ufficio centrale di meteorologia e di geodinamica.
Annali ... Serie seconda. v. 17. Partie 3. 1895. Roma. 1907. xii, 283 p. f°.

Manchester university. Meteorological department.
Report on the investigation of the upper atmosphere carried out at the Howard estate observatory, Glossop ... 1906–1907. Manchester. 1908. n. p. 4°.

Mellor, J. W.
Higher mathematics for students of chemistry and physics ... 2d ed. New York. 1905. xxi, 631 p. 8°.

Natal. Government astronomer.
Report ... 1907. Durban. 1908. 14 p. f°.

Prussia. Meteorologisches Institut.
Ergebnisse der Beobachtungen an den Stationen II. und III. Ordnung ... 1906. Heft 2. Berlin. 1908. 39–74 p. f°.
Ergebnisse der Gewitter-Beobachtungen ... 1903, 1904, und 1905. Berlin. 1908. xxxi, 102 p. f°.
Ergebnisse der meteorologischen Beobachtungen in Potsdam ... 1904. Berlin. 1908. xlii, 128 p. f°.
Ergebnisse der magnetischen Beobachtungen in Potsdam ... 1905. Berlin. 1908. 82 p. f°.
Ergebnisse der Niederschlags-Beobachtungen ... 1905. Berlin. 1908. xxx, 164 p. f°.

Scott, William B.
An introduction to geology. 2d ed. rev. New York. 1907. xxv, 816 p. 8°.

Selby, A. D.
Fall and early winter injuries to orchard trees and shrubbery by freezing. (Bulletin of the Ohio agricultural experiment station. no. 192. Feb., 1908. p. 129–148.)

Sjutz, Hermann.
Ueber die Bedeutung der Verwitterung für die Umgestaltung der Erdoberfläche. Inaug.-Diss ... Bonn. Lübbecke. 1907.

Tananarive. Observatoire de Madagascar.
Observations météorologiques ... 17 v. 1906. Tananarive. 1908. vi, 273 p. 8°.

Upsala. Université. Observatoire météorologique.
Bulletin mensuel. v. 39. Année 1907. Upsala. 1907. 74 p. f°.

Western Australia. Government astronomer.
Meteorological observations made at the Perth observatory, and other places in Western Australia ... 1906. Perth. 1907. 143 p. f°.

Wetzel, Guilherme.
Contribuiçao para o estudo de climatologie de Rio Grande do Sul. Observaçoes meteorologicas feitas durante o periodo de 1893 a 1907. n. p. n. d. n. pag. 8°.

RECENT PAPERS BEARING ON METEOROLOGY AND SEISMOLOGY.

C. FITZHUGH TALMAN, Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a ——

Engineering news. New York. v. 59. June 19, 1908.
Prevost-Murphy, H. M. The moisture in the atmosphere and its effect on the operation of compressed air machinery, especially air-brake, multiple-unit train control and train signal systems. p. 659–663.

Engineering news. New York. v. 60. July 9, 1908.
Creighton, E. E. F. Measurements of lightning, lightning arresters, earth-resistances, and kindred tests. [Abstract]. p. 44–45.

Experiment station record. Washington, D. C. v. 19. April, 1908.
—— Meteorology of the Transvaal. [Abstract of part of work by Praagh.] p. 711.

Forestry and irrigation. Washington, D. C. v. 14. July, 1908.
—— Government to study shelterbelts for benefit of farming interests. p. 399–401. [Describes study of windbreaks and shelterbelts to be undertaken by the U. S. Forest service.]

Meteorological society of Japan. Journal. Tokio. v. 27. May, 1908.
H. I. H. Prince Yamishina. Necrology.

Geographical journal. London. v. 31. June, 1908.
Rickmers, W. R. The climatology of west Turkestan. p. 647. [Review of work by H. von Ficker.]

Physical review. Lancaster. v. 26. June, 1908.
Zeleny, John. The influence of humidity upon the electrical discharge from points in the air. p. 448–453.
Allen, S. J. Radioactivity of a smoke-laden atmosphere. p. 483–486.
Nichols, Edward L. Theories of the color of the sky. p. 497–511.

Royal society of London. Proceedings. London. ser. A. v. 80. June 20, 1908.
Mallock, A. Note on the ascent of meteorological balloons and the temperature of the upper air. 530–534.
Wilson, C. T. R. On the measurement of the atmospheric electric potential gradient and the earth-air current. p. 537–547.
Mallock, A. Effect of a cross wind on rifled projectiles. p. 595–597.
Ramsay, William. Percentage of the inactive gases in the atmosphere: a correction to previous calculations. p. 599.

Science abstracts. London. v. 11. June 25, 1908.
W[ilkinson], A. Bohne aneroid. p. 313. [Abstract of article by Schreiber.]

Scottish geographical magazine. Edinburgh. v. 24. July, 1908.
Mossman, R. C. The South Orkneys in 1907. p. 348–355. [Description of the meteorological work.]

Symons's meteorological magazine. London. June, 1908.
Bonacina, L. C. W. The glamour of the cumulus. p. 87–89.

Ciel et terre. Bruxelles. 29me année. 16 juin 1908.
Vanderlinden, E. Météorologie et tribunaux. p. 186–191.
Vanderlinden, E. La conductibilité électrique des arbres. p. 198–199.

France. Académie des sciences. Comptes rendus. Paris. Tome 146.
Deprez, Marcel. Sur le planement des oiseaux. (13 avril 1908.) p. 797–800.
Bloch, Eugéne. Sur l'ionisation de l'air par la lumiére ultraviolette. (27 avril 1908.) p. 892–898.
Garrigou-Lagrange, Paul. La pluie et la régime des cours d'eau. (22 Juin 1908.) p. 1353–1355.

Géographie. Paris. Tome 17.
Rabot, Charles. La pluviosité en octobre 1907 dans le midi de la France. (15 janvier 1908.) p. 41–42.

Journal de physique. Paris. Tome 7. Juin 1908.
Villard, M. P. Les rayons cathodiques et l'aurore boréale. p. 429–453.
Mathias, M. E. La physique des courants d'air d'après M. Shaw. p. 463–475.

Gaea. Leipzig. 44. Jahrgang. July 1908.
Müllermeister, Otto. Meteorologisches Glaubensbekenntniss. p. 388–392.

Mitteilungen aus den deutschen Schutzgebieten. Berlin. 21. Band. 1908.
——Die Resultate der Regenmessungen in Togo im Jahre 1907. p. 140–145.

Physikalische Zeitschrift. Leipzig. 9. Jahrgang.
Kähler, Karl. Registrierung der Niederschlagselektrizität mit dem Benndorf-Elektrometer. (15. April 1908.) p. 258–260.

Weltall. Berlin. 8. Jahrgang.
Archenhold, F. S. Ueber ein sechsstündiges Gewitter und einen ausserordentlichen Hagelfall am 22 Mai 1908. (1. Juni 1908.) p. 265–269.

Wiener Luftschiffer-Zeitung. Wien. 7. Jahrgang. Juni 1908.
Hildebrandt, A. Ballonforschungen im Eismeere. (Die aëronautisch-meteorologische Schiffsexpedition Hewald-Hildebrandt nach Island, in das nördliche Eismeer und in den Atlantischen Ozean.) p. 97–98.
Fonvielle, Wilfrid de. Die Temperatur in hohen Regionen. p. 119–120.

Reale accademia dei Lincei. Atti. Roma. v. 17. 1. sem. Fasc. 8.
Zappa, Giovanni. Contributo alla spiegazione degli aloni: la deviazione minima con reflessioni interne nei cristalli. p. 519–531.

AN ANNOTATED BIBLIOGRAPHY OF EVAPORATION.[1]

By MRS. GRACE J. LIVINGSTON. Dated Washington, D. C., January 8, 1908.

INTRODUCTION.

The aim of the bibliographer has been not merely to give a list of the titles of publications bearing on or referring to the subject of evaporation, but to set before the reader a sufficiently full summary of each reference, so far as it has been accessible, so that the actual work need not be consulted except in cases where the fullest information is required. Articles bearing on the subject from the point of view of the meteorologist, the agriculturist, the irrigation and hydraulic engineer, have been included wherever found. Hygrometry, however, has been regarded as a distinct subject and only articles which deal with the subject in a general way, or which relate it in any way to the measurement of evaporation have been included. Evaporation from plants, or transpiration, has not been specifically included, as that subject has been so thoroly reviewed by Burgerstein, Transpiration der Pflanzen.

The subject thus restricted has been interesting, mainly

[1] This bibliography is published at the urgent request of many investigators who have examined the manuscript. It has not been practicable to verify all the formulas and references nor to insert any illustrative figures.—*C. A.*